Attorney Docket No. 03653/LH

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant(s)	:	Naobumi OKADA
Serial No.	:	10/696,532
Confirm. No.	:	6456
Filed	:	October 28, 2003
For	:	MICRODISSECTION APPARATUS AND METHOD
Art Unit	:	3742
Examiner	:	Maria Alexandra Elve
Appeal No.	:	

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Mail Stop Appeal Briefs - Patents

Applicant hereby appeals the Final Rejection of claims 1-36 of the above-identified application as set forth in the Final Office Action dated December 31, 2007, and the Advisory Action dated April 14, 2008.

A Notice of Appeal was filed in the Patent Office with the appropriate fee on April 30, 2008.

A Petition for a One Month Extension of Time to extend the deadline for filing this Appeal Brief from June 30, 2008, to July 30, 2008 is submitted herewith.

Accordingly, this Appeal Brief is being timely filed by the due date of July 30, 2008.

The fee of $510.00 for filing a brief in support of an appeal as set forth in 37 CFR 41.20(b)(2) is being paid by credit card herewith.

In addition, authorization is hereby given to charge any additional fees which may be determined to be required, or credit any overpayment, to Deposit Account No. 06-1378.

(i) REAL PARTY IN INTEREST

The real party in interest is OLYMPUS CORPORATION, a corporation of Japan, having a business address at 43-2, Hatagaya 2-chome, Shibuya-ku, Tokyo, Japan.

(ii) RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

(iii) STATUS OF CLAIMS

This is an appeal from the Final Rejection of claims 1-36. The appealed claims are set forth in the attached Appendix.

(iv) STATUS OF AMENDMENTS

An Amendment was filed on March 31, 2008, in response to the Final Office Action issued December 31, 2007. The Amendment was not entered for the purposes of appeal in the Advisory Action issued April 24, 2008.

Thus, the appealed claims are claims 1-36 as set forth in the Amendment filed on September 27, 2006, in response to the Office Action issued June 28, 2006.

(v) SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 recites a microdissection apparatus (Figs. 1, 3, 4, 5, 6 and 7) comprises: a laser light source (14) to emit laser light (page 8, lines 2-3); and a laser light irradiation optical system (15, 12, 13, 3 in Fig. 1; 15, 241, 25, 242, 13, 3 in Fig. 5) to irradiate a sample (4) with the laser light from the laser light source (14) (page 8, lines 3-9 and page 8, line 14 to page 9, line 1; page 22, lines 12-18).

According to independent claim 1, the laser light irradiation optical system comprises: (i) an active optical element (12 in Fig. 1 or 25 in Fig. 5) on which a variable pattern (4c, Fig. 2B) set to correspond to a necessary area (4a, Fig. 2A) is formed (page 8, lines 9-13; page 11, line 22 to page 12, line 2; page 13, lines 3-18; page 22, line 18 to page 23, line 7; page 26, lines 2-21), and (ii) an objective lens

(3) which is positioned between the active optical element (12 or 25) and the sample (4) (Fig. 1 or 5).

In addition, according to independent claim 1, the laser light is irradiated through the active optical element (12 or 25) on which the variable pattern (4c) is formed, and guided to the sample (4) by the objective lens (3) so that a part (e.g., the part irradiated through pattern 4c) of the sample (4) excluding the necessary area (4a) is irradiated with the laser light (page 15, lines 1-13).

Independent claim 12 recites a microdissection apparatus (Figs. 1, 3, 4, 5, 6 and 7) comprises: a light source means (14) for emitting laser light (page 8, lines 2-3); and a laser light irradiation optical system (15, 12, 13, 3 in Fig. 1; 15, 241, 25, 242, 13, 3 in Fig. 5) to irradiate a sample (4) with the laser light from the light source means (14) (page 8, lines 3-9; page 8, line 14 to page 9, line 1; page 22, line 18 to page 23, line 7).

In addition, according to independent claim 12, the laser light irradiation optical system comprises: (i) pattern forming means (12 or 25) for transmitting or reflecting the laser light selectively in accordance with a variable pattern (4c, Fig. 2B) which is set to correspond to a necessary area (4a, Fig. 2A) (page 8, lines 9-13; page 11, line 22 to page 12, line 2; page 13, lines 3-18; page 22,line 18 to page 23, line 7; page 26,

lines 2-21), and (ii) an objective lens (3) which is positioned between the pattern forming means (12 or 25) and the sample (4) (Fig. 1 or 5).

And according to independent claim 12, the laser light is irradiated to the sample (4) through the variable pattern (4c) formed by the pattern forming means (12 or 25), and guided to the sample (4) by the objective lens (3) so that a part (e.g., the part irradiated through pattern 4c) of the sample (4) excluding the necessary area (4a) is irradiated with the laser light (page 15, lines 1-13).

Independent claim 23 recites a microdissection method comprises: forming a variable pattern (4c, Fig. 2B) on an active optical element (12 or 25) such that the pattern is set to correspond to a necessary area (4a, Fig. 2A) of a sample (4) (page 8, lines 9-13; page 11, line 22 to page 12, line 2; page 13, line 13-18; page 22, line 18 to page 23, line 7; page 26, lines 2-21).

In addition, independent claim 23 recites irradiating the active optical element (12 or 25) with laser light (page 14, line 26 to page 15, line 6).

And independent claim 23 recites guiding the laser light from the active optical element (12 or 25) to the sample (4), via an objective lens (3) positioned between the active optical element (12) and the sample (4), so as to irradiate a part

(e.g., the part irradiated through pattern 4c)of the sample (4) excluding the necessary area (4a) with the laser light (Figs. 1 or 5; page 15, lines 7-13).

For simplicity, claims 1, 12 and 23 have been summarized primarily with respect to Fig. 1 and the "First Embodiment" described in the specification at pages 7-14. References to Fig. 5 and the "Second Embodiment" described in the specification at page 22-29 have been made to clarify that the active optical element may be transmissive (12, Fig. 1) or reflective (25, Fig. 5).

However, the independent claims are not limited to the embodiments shown in Figs. 1 and 5. For example, the objective lens 3 mentioned above may be replaced with the objective lens 6 shown in Figs. 3, 4, 6 and 7. Moreover, a relay lens 131 may be provided as shown in Figs. 7 and 8, and irradiation may be performed as shown in Figs. 9 and 10, and is not limited to that shown in Fig. 2.

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection presented for review are whether claims 1-36 are obvious under 35 USC 103 in view of the combination of USP 6,639,657 ("Baer et al") and USP 4,842,782 ("Portney et al").

(vii) ARGUMENT

The Rejection under 35 USC 103 in view of Baer et al and Portney et al

Each of claims 1, 4, 5, 7, 12, 15, 16, 18, 23, 25, 26, 30, 31, 34 and 35 is argued separately below.

Claims 1, 12 and 23 are independent claims. Claims 4, 5, 7, 15, 16, 18, 25, 26, 30, 31, 34 and 35 are dependent claims which, despite requests by the applicant (see, for example, page 10 of the Response filed on October 11, 2007), have not been specifically addressed by the Examiner.

First, for the Board's reference, the disclosure of Baer et al (as it relates to the structure of Baer et al cited by the Examiner) and the disclosure of Portney et al will be briefly summarized.

Baer et al discloses a laser capture microdissection ("LCM") apparatus. As explained in the background section of Baer et al, in laser capture microdissection, a thermoplastic film is placed over and in contact with a tissue sample. The operator views the tissue sample and identifies cells of interest, and the operator targets the cells with a laser. The laser causes localized heating in the thermoplastic film, which causes the cells of interest in the sample to adhere to the heated portion of the film. As a result, the cells adhered to the film can be

extracted for analysis by lifting the film from the tissue, such as for gene and enzyme activity. (Column 1, lines 47-64 and column 2, lines 40-49.)

According to Baer et al, a microcentrifuge tube cap 120 is provided with a laser capture microdissection transfer film and is placed on a glass slide 130 on which a sample to be microdissected is located. (See, for example, column 5, lines 11-17 and 23-26.) In the structure of Fig. 3 of Baer et al (the structure referred to by the Examiner), for example, film activation laser 320 is provided. A laser beam path 310 begins at the film activation laser 320, is reflected by a mirror 330, is reflected by a dichroic mirror 340, is focused by lens 350 and passes to the microcentrifuge tube cap 120. (See, for example, column 6, lines 29-42.) The portion of the laser capture microdissection film (of the tube cap 120) irradiated with the laser melts and adheres to the sample, adhering a portion of the sample to the film to allow the adhered portion of the sample to be acquired (laser capture microdissection as described above; see, for example, column 2, lines 40-49).

According to Baer et al, moreover, the diameter of the laser beam may be changed to adjust the size of the sample to be obtained. (column 7, lines 12-25). Specifically, Baer et al discloses that the lens 350 may be associated with a structure such as a variable aperture for changing the beam diameter

(column 6, lines 34-36). Baer et al suggests employing a stepped glass prism 380 to change the optical path length and alter the spot size of the laser beam (column 7, lines 22-24).

Baer et al also discloses observing and capturing an image of the sample. Specifically, in the structure of Fig. 3 (cited by the Examiner), after the laser beam path 310 passes through the sample, the laser beam passes through an objective lens 360 below the sample, and is reflected to the ocular 370. A cut-off filter 390 in the ocular 370 reflects and/or absorbs energy from the laser beam. To capture an image of the sample, Baer et al discloses an image acquisition system 230, which is provided below the sample as shown in Fig. 2A, and thus receives light that has passed through the sample as shown in Fig. 2A. (See, for example, column 6, lines 37-54.)

Portney et al has been cited as disclosing (according to the Examiner) an active optical element or pattern forming means as recited in independent claims 1, 12 and 23.

Portney et al relates to manufacturing ophthalmic lenses (unlike the claimed present invention and Baer et al, which relate to microdissection of a sample). More specifically, Portney et al relates to creating an intraocular lens, including both an optic 12 (the actual lens) and a haptic 14 (which anchors the lens in the patient's eye) from a block of polymethyl-metacrylate (PMMA) using a variety of masks and optical systems.

According to Portney et al, a mask 22 (Fig. 3) is used to cut a workpiece 10 (Fig. 1) from a block of PMMA by irradiating a laser beam from a laser 16 through a beam expander 20 onto the mask 22 which permits only a narrow strip of light in the shape of the outline 24 of the workpiece 10 to pass. A beam converger/focusing optic 26 projects an image of the outline 24 from the mask onto the PMMA block 28 until the workpiece 10 (Fig. 1) is cut out. (See column 2, line 44 to column 3, line 9.)

Next, according to Portney et al, the workpiece 10 (Fig. 1) is shaped. More specifically, a laser beam 30 is irradiated onto the workpiece 10 through a mask 32 (Fig. 5) that has different degrees of transparency at different positions. That is, a large amount of the laser beam is transmitted at areas 34 of the mask, and a small amount of the laser beam is transmitted at areas 36, to create depressions and protrusions in the surface 38 of the workpiece 10 (Fig. 4). (See column 3, lines 10-36.)

Next, according to Portney et al, the edges of the workpiece 10 are rounded. More specifically, a laser beam 40 is expanded by a beam expander or "preferably" by curved mirrors 42 and 44, and is transmitted through a mask 48 (Fig. 7) and then through a focusing lens 50. According to Portney et al, this structure produces a beam shaped generally as a hollow cone. The workpiece 10 is positioned first below a focal point 52 (Fig. 6)

of the laser beam at 54 and then above the focal point 52 at 62 (Fig. 6) so as to bevel the edges of the workpiece (Figs. 8 and 9). (See column 3, line 45 to column 4, line 7.)

Thus, Baer et al (in particular Fig. 3 thereof cited by the Examiner) relates to a laser microdissection apparatus which operates by irradiating a portion of the sample necessary for analysis, so as to cause the necessary portion of the sample to adhere to a film. Portney et al relates to manufacturing ophthalmic lenses from a block of material using a variety of masks and optical systems. The Examiner asserts that in combination, Baer et al and Portney et al render obvious each of claims 1-36.

<u>Re: Claims 1-3, 6, 10, 11, 27-29, 32, 33 and 36</u>

The Examiner asserts on page 2 of the Final Office Action that element 360 of Baer et al corresponds to the objective lens recited in claim 1. Moreover, in the Response to Arguments section on page 3 of the Final Office Action, the Examiner points out that according to Baer et al, laser light passes through the objective lens.

It is respectfully pointed out that even according to the portion of Baer et al cited by the Examiner on page 3 of the Office Action (column 6, lines 29-42), the laser beam path 310

passes through the objective lens 360 after passing through the microcentrifuge cap 120.

That is, as is clearly shown in Fig. 3 of Baer et al, the laser beam reaches the objective lens 360 after passing through the sample (where the cap 120 is provided in Fig. 3). In other words, as can clearly be seen in Fig. 3 of Baer et al, the sample is irradiated with laser light from above, and the objective lens 360 is provided below the sample. Thus, the objective lens 360 does not at all guide the laser beam to the sample (to the cap 120).

By contrast, according to independent claim 1, "the laser light is...guided to the sample by the objective lens" (claim 1, lines 10-12). Thus, according to claim 1, the objective lens must be positioned such that it can guide the laser light to the sample. Clearly, the objective lens 360 of Baer et al, which receives the laser light after the light has passed through the sample, cannot be positioned in the manner of the objective lens recited in claim 1.

Moreover, according to claim 1, the "objective lens [] is positioned between the active optical element and the sample" (claim 1, lines 8-9). As recognized by the Examiner, Baer et al does not disclose an active optical element. However, even if it were reasonable to modify Baer et al to provide an active optical element as recited in claim 1, such an active optical element

would naturally be positioned above the sample in the structure of Fig. 3 of Baer et al, so that light to the sample could be irradiated to through the active optical element (as recited at lines 10-11 of claim 1). Accordingly, an objective lens positioned between the active optical element and the sample would also be positioned above the sample in the structure of Fig. 3 of Baer et al (if it were reasonable to modify Baer et al to include an active optical element). By contrast, as pointed out above, the objective lens 360 of Baer et al is provided below the sample, which receives the laser light <u>after the light has passed through the sample</u>.

Thus, according to claim 1, the objective lens "is positioned between the active optical element and the sample" and the objective lens "guid[es] to the sample" the laser light that is irradiated through the active optical element. And it is respectfully submitted that the objective lens 360 of Baer et al <u>does not satisfy either of these features</u> of the objective lens recited in independent claim 1. Indeed, the objective lens 360 of Baer et al, on the other hand, is provided below the sample for the purposes of observation.

Accordingly, contrary to the Examiner's assertions on pages 2 and 3 of the Office Action, the objective lens 360 of Baer et al does not correspond to the objective lens recited in claim 1.

The Examiner has also referred to a lens 350 of Baer et al, which is, in fact, provided above the sample in Fig. 3 of Baer et al. The Examiner has not indicated what feature of the claimed present invention to which this lens 350 of Baer et al is believed to correspond. In any event, the objective lens 360 of Baer et al cannot logically be interpreted as corresponding to the objective lens recited in claim 1 in the manner asserted by the Examiner.

The Examiner appears to acknowledge on page 2 of the Office Action that Baer et al does not disclose an active optical element on which a variable pattern set to correspond to a necessary area is formed (the Examiner actually only refers to pattern forming means, which is recited in independent claim 12), as recited in claim 1. The Examiner has cited Portney et al to supply the missing teachings of Baer et al.

Moreover, in the Response to Arguments section on page 3 of the Final Office Action, the Examiner asserts that "the disclosed mask [of Portney et al] is fully capable of [the functions of the active optical element]." More specifically, the Examiner asserts that according to Portney et al "if the mask is shifted or changed out[,] the pattern changes, thus the prior art does teach different positioning."

It is respectfully pointed out that claim 1 recites an <u>active</u> optical element, on which a <u>variable</u> pattern that is <u>set</u>

to correspond to a necessary area is formed. Examples of an active optical element as described in the specification are a transmission type liquid crystal substrate 12, and a micro mirror array 25.

Although the claims are not limited by the specification, claim 1 recites that the optical element is active. Moreover, claim 1 recites that a variable pattern is set on the active optical element.

Thus, the plain language of claim 1 clearly recites an active element having a variable (changeable) pattern set thereon. And claim 1 as interpreted in light of the specification also clearly recites an active element having a variable (changeable) pattern set thereon.

By contrast, Portney et al discloses a plurality of fixed masks. The mask 22 is a fixed mask for cutting out the workpiece 10. The mask 32 is a fixed mask for shaping the surface of the workpiece 10. And the mask 48 is a fixed mask for rounding the edges of the workpiece 10. Thus, it is respectfully submitted that none of the masks 22, 32 and 48 Portney et al is an active optical element on which a variable pattern is set in the manner recited in claim 1.

More specifically, Portnoy et al contains no disclosure to suggest that mask 22 (Fig. 3) is an "active" optical element or to that the pattern on mask 22 (namely, the outline 24) is

"variable." Thus, it is respectfully submitted that Portnoy et al clearly does not suggest that mask 22 can be set with a "variable" pattern. Instead, Portnoy et al merely discloses that mask 22 has one fixed pattern corresponding to the desired outline 24.

In the same manner, Portnoy et al does not suggest that mask 48 (Fig. 7) has anything other than a single fixed pattern as shown in Fig. 7. That is, Portnoy et al contains no disclosure to suggest that the mask 48 can be set to have a pattern different from the one illustrated in Fig. 7. Clearly, therefore, the mask 48 shown in Fig. 7 of Portnoy et al is not an "active" optical element, nor can a "variable" pattern be formed on the mask 48.

Portnoy et al also contains no disclosure to suggest that mask 32 (Fig. 5) is an "active" optical element or that a "variable" pattern can be formed on the mask 32. Indeed, Portnoy et al provides examples of structures for forming the mask 32, including "a coating," "a natural density filter" or a mirror with a "reflective coating." According to Portnoy et al, the transmission characteristics of the mask 32 vary across the mask. <u>However</u>, Portnoy et al clearly does not suggest that the pattern formed on the mask 32 can be varied. That is, while the mask 32 has a pattern having different degrees of transparency at different portions, this pattern is <u>fixed</u>, and the mask 32 is not

"active" and is not capable of having a "variable" pattern formed thereon that is "set to correspond to a necessary area."

With respect to the mask 32 of Portnoy et al, moreover, it is respectfully pointed out that Portnoy et al does <u>not disclose that the mask 32 excludes any area of the workpiece 10 from being irradiated with light</u>. By contrast, according to independent claim 1, the laser light is irradiated through (transmitted through or reflected by) the active optical element such that "a part of the sample <u>excluding the necessary area</u> is irradiated with the laser light" (claim 1, lines 12-14; emphasis added). It is respectfully submitted that Portnoy et al does not disclose or suggest that the mask 32 has such a structure.

Thus, it is respectfully submitted that <u>none</u> of masks 22, 32 and 48 of Portnoy et al is an <u>active</u> optical element as recited in claim. In addition, it is respectfully submitted that Portnoy et al does not disclose or suggest that any of masks 22, 32 and 48 has a <u>variable</u> pattern formed thereon, or that such a <u>variable</u> pattern is set to correspond to a necessary area, as recited in claim 1.

Moreover, it is respectfully pointed out that moving a mask of Portney et al does not change the pattern on the mask itself, but rather merely changes the location of the mask. That is, "shift[ing]" a mask with a fixed pattern, as suggested by the Examiner on page 3 of the Final Office Action, merely shifts the

mask with the fixed pattern to a different location; such "shift[ing]" does not actually vary the pattern on the mask. In any event, it is respectfully pointed out that Portney et al does not actually disclose or suggest "shift[ing]" the masks thereof. Indeed, shifting the masks with respect to the workpiece 10 presumably cause areas of the workpiece 10 to be irradiated in a manner not intended by Portney et al (which is directed to accurately forming a particular structure).

It is respectfully submitted, moreover, that by asserting on page 3 of the Final Office Action that one could change the masks of Portney et al to change the pattern ("if the mask is ... changed out the pattern changes"), the Examiner implicitly acknowledges that Portney et al does not disclose an "active" optical element on which a "variable" pattern is formed. That is, it is respectfully submitted that a plurality of optical elements each having fixed patterns does not correspond to an "active" optical element or an element on which a "variable" pattern set to correspond to a necessary area is formed.

Indeed, changing one fixed mask of Portney et al for another fixed mask is merely an act of replacing one optical element with another. Such an act does not change the pattern on any optical element. That is, replacing one optical element with another does not cause either of the optical elements to be "active" or to have a "variable" pattern set thereon.

Thus, it is respectfully submitted that Portney et al does <u>not</u> in fact disclose or suggest an <u>active</u> optical element on which a <u>variable</u> pattern <u>set</u> to correspond to a necessary area is formed, in the manner recited in claim 1.

It is respectfully submitted, moreover, that the Examiner suggested combination of Baer et al with Portney et al is merely based on hindsight reasoning in an attempt to form the structure recited in claim 1.

That is, as explained above (pages 7 and 8), Fig. 3 of Baer et al (cited by the Examiner) relates to a structure in which a desired area of a sample is irradiated with a laser to cause a film to adhere to the desired area of the sample, so that the desired are can be extracted for analysis. By contrast, as also explained above (pages 9-11) Portney et al relates to manufacturing ophthalmic lenses from a block of material using a variety of masks and optical systems by <u>cutting out</u> the lens from a block and shaping the lens. In other words, in Baer et al the desired area is irradiated with laser light, whereas in Portney et al the desired area is <u>not</u> irradiated with laser light.

Thus, it is respectfully submitted that the Examiner's suggested modification of the structure of Fig. 3 of Baer et al in view of Portney et al would change the principle of operation of this structure of Baer et al, and is therefore not an obvious modification (see MPEP 2143.02 VI, "If the proposed modification

or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).")

Thus, in view of the foregoing, it is respectfully submitted that the Examiner's interpretation of Baer et al with respect to claim 1 (i.e., with respect to the objective lens 360 of Baer et al) is not reasonable. In addition, it is respectfully submitted that Portney et al does not, in fact, disclose or suggest an active optical element as recited in claim 1. Therefore, it is respectfully submitted that even if Portney et al and Baer et al were combinable in the manner suggested by the Examiner, the structure recited in independent claim 1 still would not be achieved or rendered obvious. Still further, it is respectfully submitted that Portney et al is not, in fact, properly combinable with Baer et al as suggested by the Examiner, and it is respectfully submitted that the Examiner's suggested combination of an ophthalmic lens manufacturing method with the laser microdissection apparatus of Baer et al is merely based on hindsight reasoning.

Accordingly, it is respectfully requested that the rejection of claim 1, and all of the claims depending therefrom, under 35

USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 4

Claim 4 depends from claim 3, which depends from claim 2. Thus, in addition to the structure of claim 1 described above, the structure of the apparatus recited in claim 4 includes: a pattern image projection optical system, which projects an image of the pattern formed on the active optical element onto the sample (as recited in claim 2); and an observation optical system, which acquires an observation image of the sample (as recited in claim 3).

Still further, claim 4 itself recites a display unit to display the observation image acquired by the observation optical system, and an input unit to input information for setting the pattern formed on the active optical element.

Portney et al has been as disclosing an active optical element. However, as explained hereinabove with respect to claim 1, each of the masks (22, 32 and 48) of Portney et al has a fixed pattern. And it is respectfully submitted that Portney et al does not at all suggest that the pattern on any of the masks can be set by a control unit in accordance with input information. Thus, Portney et al clearly fails to suggest an apparatus that includes an input unit to input information for

<u>setting the pattern formed on the active optical element</u> as recited in claim 4. With this structure of claim 4, the user can set a shape and/or position of the pattern with respect to the sample while viewing the acquired observation image. (See the disclosure in the specification at, for example, page 13, lines 3-18 and page 26, lines 7-21 with respect to this structure.)

It is respectfully submitted that Portney et al does not at all suggest that the patterns on the fixed masks 22, 32 and 48 are set in accordance with input information. And as recognized by the Examiner, Baer et al does not disclose an active optical element. Therefore, Baer et al clearly cannot disclose inputting information for setting the pattern formed on the active optical element.

Moreover, the Examiner has <u>not even mentioned</u> an input unit as recited in claim 4.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 4. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 4.

Accordingly, it is respectfully requested that the rejection of claim 4 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 5

Claim 5 depends from claim 3, which depends from claim 2. Thus, in addition to the structure of claim 1 described above, the structure of the apparatus recited in claim 5 includes: a pattern image projection optical system, which projects an image of the pattern formed on the active optical element onto the sample (as recited in claim 2); and an observation optical system, which acquires an observation image of the sample (as recited in claim 3).

Still further, claim 5 itself recites a control unit to set the pattern formed on the active optical element based on the observation image acquired by the observation optical system.

Portney et al has been as disclosing an active optical element. However, as explained hereinabove with respect to claim 1, each of the masks (22, 32 and 48) of Portney et al has a fixed pattern. And it is respectfully submitted that Portney et al does not at all suggest that the pattern on any of the masks can be set by a control unit in accordance with an observation image of a sample. Thus, Portney et al clearly fails to suggest an apparatus that includes a control unit to set the pattern formed on the active optical element based on the observation image acquired by the observation optical system as recited in claim 5.

Indeed, it is respectfully submitted that Portney et al does not at all suggest that the patterns on the fixed masks 22, 32 and 48 are set in accordance with an observation image of the workpiece. And as recognized by the Examiner, Baer et al does not disclose an active optical element. Therefore, Baer et al clearly cannot disclose setting the pattern formed on the active optical element in accordance with an observation image of the sample, as recited in claim 5.

Moreover, the Examiner has <u>not even mentioned</u> a control unit as recited in claim 5.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 5. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 5.

Accordingly, it is respectfully requested that the rejection of claim 5 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

<u>Re: Claims 7-9</u>

Claim 7 depends from claim 1 and recites that the laser light irradiation optical system further comprises a relay lens which is removably inserted into an optical path between the active optical element and the objective lens, and a relay lens

insertion/removal mechanism to insert and remove the relay lens into and from the optical path. See relay lens 131 in Figs. 7 and 8 and relay lens attachment detachment mechanism 132 in Fig. 7.

Moreover, according to claim 7, when the relay lens is inserted in the optical path, the active optical element forms the pattern corresponding to the necessary area, and the laser light irradiation optical system selectively irradiates the part of the sample excluding the necessary area with the laser light in accordance with the pattern formed on the active optical element, and when the relay lens is removed from the optical path, the laser light irradiation optical system converges a beam of laser light by the objective lens to irradiate the sample with the converged beam.

With this structure, a state of irradiating laser light to a sample is selectable by inserting or removing the relay lens. When the relay lens is inserted, the laser light irradiation optical system irradiates the sample in accordance with the pattern formed on the active optical element. On the other hand, when the relay lens is removed from the optical path, the sample is irradiated with the converged beam. The converged beam may, for example, cause the irradiated part of the sample to evaporate (as recited in dependent claim 8).

The structure recited in claim 7 therefore can enable the user to select the power density of the laser light irradiated to the sample.

The Examiner has not mentioned what portion of Baer et al or Portney et al is considered to correspond to a relay lens as recited in claim 7. The Examiner does mention a lens 350 of Baer et al on page 2 of the Office Action. However, the Examiner does not mention what element of the claims to which the lens 350 is considered to correspond. Moreover, the Examiner does not assert, and Baer et al does not disclose, that the lens 350 is a relay lens that is movable into and out from the optical path between the active optical element and the objective lens as recited in claim 7.

And the Examiner has <u>not even mentioned</u> "a relay lens insertion/removal mechanism to insert and remove the relay lens into and from the optical path" as recited in claim 7.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 7. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 7.

Accordingly, it is respectfully requested that the rejection of claim 7, and claims 8 and 9 depending therefrom, under 35 USC

103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 30

Claim 30 depends from claim 3, which depends from claim 2. Thus, in addition to the structure of claim 1 described above, the structure of the apparatus recited in claim 30 includes: a pattern image projection optical system, which projects an image of the pattern formed on the active optical element onto the sample (as recited in claim 2); and an observation optical system, which acquires an observation image of the sample (as recited in claim 3).

Still further, claim 30 itself recites that the objective lens of the laser light irradiation optical system is also part of the observation optical system.

The Examiner has not mentioned what structure of Baer et al or Portney et al might correspond to this structure of claim 30.

It is respectfully pointed out, moreover, that as described above with respect to claim 1 (pages 11-13), the objective lens 360 of Baer et al is provided below the sample for the purposes of observation. By contrast, the objective lens recited in claim 1 "is positioned between the active optical element and the sample" and "guid[es] to the sample" the laser light that is irradiated through the active optical element.

As also described above (pages 8-9) Baer et al discloses observing an image through an ocular 370 and capturing an image by the image acquisition system 230 (Figs. 2 and 3). The light for observation and image acquisition does pass through the objective lens 360 according to Baer et al. However, the objective lens 360 does not guide the laser light to the sample in the structure of Fig. 3 of Baer et al.

It is respectfully submitted, therefore, that Baer et al clearly fails to disclose the structure of claim 30 whereby the objective lens of the laser light irradiation optical system is also part of the observation optical system.

It is respectfully submitted that Portney et al also fails to disclose the structure of claim 30. And it is respectfully submitted that neither Baer et al nor Portney et al, even if considered in combination, discloses or suggests the structure of claim 30.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 30. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 30.

Accordingly, it is respectfully requested that the rejection of claim 30 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 31

Claim 31 depends from claim 27, which depends from claim 1. Thus, in addition to the structure of claim 1 described above, the structure of the apparatus recited in claim 31 includes an observation optical system, which acquires an observation image of the sample (as recited in claim 27).

Still further, claim 31 itself recites that the objective lens of the laser light irradiation optical system is also part of the observation optical system.

In the manner explained hereinabove with respect to claim 30, it is respectfully submitted, therefore, that Baer et al clearly fails to disclose the structure of claim 31 whereby the objective lens of the laser light irradiation optical system is also part of the observation optical system.

It is respectfully submitted, moreover, that Portney et al also fails to disclose the structure of claim 31. And it is respectfully submitted that neither Baer et al nor Portney et al, even if considered in combination, discloses or suggests the structure of claim 31.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 31. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 31.

Accordingly, it is respectfully requested that the rejection of claim 31 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 34

Claim 34 depends from claim 10, which depends from claim 1. Thus, in addition to the structure of claim 1 described above, according to claim 34, the active optical element comprises a transmission type active optical element (as recited in claim 10).

Still further, claim 34 itself recites that the transmission type active optical element comprises a liquid crystal substrate.

The Examiner has not mentioned the liquid crystal substrate recited in claim 34 in the Final Office Action.

In particular, as noted above with respect to claims, the Examiner has acknowledged that Baer et al does not disclose an active optical element.

Moreover, although the masks 22, 32 and 48 of Portney et al have been cited with respect to the active optical element, clearly none of the masks disclosed by Portney et al is a liquid crystal substrate as recited in claim 34. Moreover, Portney et al does not suggest that the masks 22, 32 and/or 48 may be liquid crystal substrates.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 34. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 34.

Accordingly, it is respectfully requested that the rejection of claim 34 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 35

Claim 35 depends from claim 11, which depends from claim 1. Thus, in addition to the structure of claim 1 described above, according to claim 35, the active optical element comprises a reflection type active optical element (as recited in claim 11).

Still further, claim 35 itself recites that the reflection type active optical element comprises a micro mirror array.

The Examiner has not mentioned the micro mirror array recited in claim 35 in the Final Office Action.

In particular, as noted above with respect to claims, the Examiner has acknowledged that Baer et al does not disclose an active optical element.

Moreover, although the masks 22, 32 and 48 of Portney et al have been cited with respect to the active optical element, clearly none of the masks disclosed by Portney et al is a micro

mirror array as recited in claim 35. Moreover, Portney et al does not suggest that the masks 22, 32 and/or 48 may be liquid crystal substrates.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 35. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 35.

Accordingly, it is respectfully requested that the rejection of claim 35 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

<u>Re: Claims 12-14, 17, 21 and 22</u>

Independent claim 12 differs from independent claim 1 in that claim 12 recites certain limitations in "means-plus-function" form in accordance with 35 USC 112, sixth paragraph.

In particular, instead of reciting an active optical element, claim 12 recites that the laser light irradiation optical system comprises "pattern forming means for transmitting or reflecting the laser light selectively in accordance with a variable pattern which is set to correspond to a necessary area."

The structure in the specification corresponding to the pattern forming means recited in claim 12 is the transmission type active optical element 12, which is a liquid crystal

substrate, for example (page 8, lines 9-13), or the reflective type active optical element 25, which is a micro mirror array, for example (page 22, lines 18-23).

Thus, as described in the specification with respect to elements 12 and 25, the structure (12 or 25) corresponding to the pattern forming means recited in claim 12 is an element which can set a variable (changeable) pattern so as to selectively reflect or transmit light.

The Examiner appears to acknowledge on page 2 of the Office Action that Baer et al does not disclose pattern forming means as recited in claim 12. The Examiner has cited Portney et al to supply the missing teachings of Baer et al.

However, as explained above with respect to claim 1 (pages 14-18), each of the masks 22, 32 and 48 of Portney et al is a fixed mask. That is, none of the masks 22, 32 and 48 of Portney is capable of forming a variable pattern that is set to correspond to a necessary area in the manner of the pattern forming means recited in claim 12.

Moreover, according to claim 12, the recitation of the "pattern forming means" is a means-plus-function recitation in accordance with 35 USC 112, sixth paragraph.

Accordingly, the Examiner may not disregard the structure disclosed in the specification corresponding to the "pattern

forming means" when rejecting claim 12. (See, for example, the discussion in MPEP 2181.)

And it is respectfully submitted that the masks 22, 32 and 48 of Portney et al clearly are not equivalent to the structure (transmission type active optical element 12 or reflective type active optical element 25) disclosed in the specification that corresponds to the pattern forming means.

Indeed, on page 3 of the Final Office Action the Examiner asserts that "shift[ing] or chang[ing] out" the masks 22, 32 and 48 of Portney et al would result in a variable pattern. However, as explained above with respect to claim 1, "shift[ing]" a mask with a fixed pattern, as suggested by the Examiner, merely shifts the mask with the fixed pattern to a different location; such "shift[ing]" does not actually vary the pattern on the mask.

Moreover, a structure of three masks that are "changed out" to vary a pattern <u>clearly substantially differs</u> from the structure (transmission type active optical element 12 or reflective type active optical element 25) disclosed in the specification that corresponds to the pattern forming means. More specifically, the transmission type active optical element 12 and the reflective type active optical element 25 described in the specification set a pattern that can be changed on the same element (e.g., by a liquid crystal substrate or a micro mirror array). "Chang[ing] out" fixed masks as suggested

by the Examiner clearly does not correspond to, or even suggest, this structure in the specification corresponding to the pattern forming means of claim 12.

Thus, it is respectfully submitted that Portney et al does not in fact disclose or suggest pattern forming means for transmitting or reflecting the laser light selectively in accordance with a variable pattern which is set to correspond to a necessary area, in the manner recited in claim 12.

Moreover, claim 12 recites an objective lens which is positioned between the pattern forming means and the sample, and which guides laser light to the sample. As explained above with respect to claim 1 (pages 11-13), the objective lens 360 of Baer et al cannot logically be interpreted as corresponding to the objective lens recited in claim 12 in the manner asserted by the Examiner.

Still further, it is respectfully submitted that the combination of Portney et al with Baer suggested by the Examiner is not reasonable, as explained above (pages 19-20) with respect to claim 1.

Thus, in view of the foregoing, it is respectfully submitted that the Examiner's interpretation of Baer et al with respect to claim 12 (i.e., with respect to the objective lens 360 of Baer et al) is not reasonable. In addition, it is respectfully submitted that Portney et al does not, in fact, disclose or suggest pattern

forming means for transmitting or reflecting the laser light selectively in accordance with a variable pattern which is set to correspond to a necessary area, as recited in claim 12. Therefore, it is respectfully submitted that even if Portney et al and Baer et al were combinable in the manner suggested by the Examiner, the structure recited in independent claim 12 still would not be achieved or rendered obvious. Still further, it is respectfully submitted that Portney et al is not, in fact, properly combinable with Baer et al as suggested by the Examiner, and it is respectfully submitted that the Examiner's suggested combination of an ophthalmic lens manufacturing method with the laser microdissection apparatus of Baer et al is merely based on hindsight reasoning.

Accordingly, it is respectfully requested that the rejection of claim 12, and all of the claims depending therefrom, under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claim 15

Claim 15 depends from claim 14, which depends from claim 13. Thus, in addition to the structure of claim 12 described above, the structure of the apparatus recited in claim 15 includes: a pattern image projection optical system, which projects an image of the pattern formed by the pattern forming means onto the

sample (as recited in claim 13); and an observation optical system, which acquires an observation image of the sample (as recited in claim 14).

Still further, claim 15 itself recites displaying means for displaying the observation image acquired by the observation optical system, and <u>inputting means for inputting information for setting the pattern formed by the pattern forming means</u>. See, for example, the monitor 17 and operation unit 18 (page 13, lines 3-18) with respect to the displaying means and the inputting means recited in claim 15.

In a similar manner to the input unit of claim 4 (see pages 21-22 above), the cited references do not disclose or suggest inputting means as recited in claim 15. Moreover, the Examiner has <u>not even mentioned</u> inputting means as recited in claim 15.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 15. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 15.

Accordingly, it is respectfully requested that the rejection of claim 15 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

<u>Re: Claim 16</u>

Claim 16 depends from claim 14, which depends from claim 13. Thus, in addition to the structure of claim 12 described above, the structure of the apparatus recited in claim 16 includes: a pattern image projection optical system, which projects an image of the pattern formed by the pattern forming means onto the sample (as recited in claim 13); and an observation optical system, which acquires an observation image of the sample (as recited in claim 14).

Still further, claim 16 itself recites <u>a controller for setting the pattern formed by the pattern forming means based on the observation image acquired by the observation optical system</u>.

In a similar manner to the control unit of claim 5 (see pages 23-24 above), the references do not disclose or suggest a controller as recited in claim 15. Moreover, the Examiner has <u>not even mentioned</u> a controller as recited in claim 15.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 16. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the structure recited in claim 16.

Accordingly, it is respectfully requested that the rejection of claim 16 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claims 18-20

Claim 18 depends from claim 12 and recites that the laser light irradiation optical system further comprises a relay lens, which is removably inserted into an optical path between the pattern forming means and the objective lens, and a relay lens insertion/removal mechanism, which inserts and removes the relay lens into and from the optical path. See relay lens 131 in Figs. 7 and 8 and relay lens attachment detachment mechanism 132 in Fig. 7.

Moreover, according to claim 18, when the relay lens is inserted in the optical path, the pattern forming means forms the pattern corresponding to the necessary area, and the laser light irradiation optical system selectively irradiates the part of the sample excluding the necessary area with the laser light in accordance with the pattern formed on the pattern forming means, and when the relay lens is removed from the optical path, the laser light irradiation optical system converges a beam of laser light by the objective lens to irradiate the sample with the converged beam.

With this structure, a state of irradiating laser light to a sample is selectable by inserting or removing the relay lens. When the relay lens is inserted, the laser light irradiation optical system irradiates the sample in accordance with the pattern formed by the pattern forming means. On the other hand,

when the relay lens is removed from the optical path, the sample is irradiated with the converged beam. The converged beam may, for example, cause the irradiated part of the sample to evaporate (as recited in dependent claim 19).

The structure recited in claim 18 therefore can enable the user to select the power density of the laser light irradiated to the sample.

As with claim 7 (pages 24-26 above), the Examiner has not mentioned what portion of Baer et al or Portney et al is considered to correspond to a relay lens as recited in claim 18. The Examiner does mention a lens 350 of Baer et al on page 2 of the Office Action. However, the Examiner does not mention what element of the claims to which the lens 350 is considered to correspond. Moreover, the Examiner does not assert, and Baer et al does not disclose, that the lens 350 is a relay lens that is movable into and out from the optical path between the pattern forming and the objective lens as recited in claim 18.

And as with claim 7, the Examiner has <u>not even mentioned</u> "a relay lens insertion/removal mechanism to insert and remove the relay lens into and from the optical path" as recited in claim 18.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the structure recited in claim 18. And it is respectfully submitted that Baer et al and

Portney et al do not, in fact, disclose or suggest the structure recited in claim 18.

Accordingly, it is respectfully requested that the rejection of claim 18, and claims 19 and 20 depending therefrom, under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

Re: Claims 23 and 24

Independent claim 23 is a method claim which recites: forming a variable pattern on an active optical element such that the pattern is set to correspond to a necessary area of a sample; irradiating the active optical element with laser light; and guiding the laser light from the active optical element to the sample, via an objective lens positioned between the active optical element and the sample, so as to irradiate a part of the sample excluding the necessary area with the laser light.

The Examiner appears to acknowledge on page 2 of the Office Action that Baer et al does not disclose forming a variable pattern on an active optical element such that the pattern is set to correspond to a necessary area of a sample (the Examiner actually only refers to pattern forming means, which is recited in independent claim 12), as recited in claim 23. The Examiner has cited Portney et al to supply the missing teachings of Baer et al.

As explained above with respect to claim 1 (see pages 14-18), Portney et al does <u>not</u> in fact disclose or suggest an <u>active</u> optical element on which a <u>variable</u> pattern <u>set</u> to correspond to a necessary area is formed, in the manner recited in claim 1.

And it is respectfully submitted that Portney et al similarly does not disclose forming a <u>variable</u> pattern on an <u>active</u> optical element such that the pattern is <u>set</u> to correspond to a necessary area of a sample, as recited in claim 23.

Moreover, claim 23 recites guiding the laser light from the active optical element to the sample, <u>via an objective lens positioned between the active optical element and the sample</u>, so as to irradiate a part of the sample excluding the necessary area with the laser light.

Accordingly, for the reasons explained above with respect to claim 1 (pages 11-13), it is respectfully submitted that the objective lens 360 of Baer et al cannot logically be interpreted as corresponding to the objective lens recited in claim 23 in the manner asserted by the Examiner.

Still further, it is respectfully submitted that the combination of Portney et al with Baer suggested by the Examiner is not reasonable, as explained above (see pages 19-20) with respect to claim 1.

Thus, in view of the foregoing, it is respectfully submitted that the Examiner's interpretation of Baer et al with respect to

claim 23 (i.e., with respect to the objective lens 360 of Baer et al) is not reasonable. In addition, it is respectfully submitted that Portney et al does not, in fact, disclose or suggest forming a <u>variable</u> pattern on an <u>active</u> optical element such that the pattern is <u>set</u> to correspond to a necessary area of a sample, as recited in claim 23. Therefore, it is respectfully submitted that even if Portney et al and Baer et al were combinable in the manner suggested by the Examiner, the structure recited in independent claim 23 still would not be achieved or rendered obvious. Still further, it is respectfully submitted that Portney et al is not, in fact, properly combinable with Baer et al as suggested by the Examiner, and it is respectfully submitted that the Examiner's suggested combination of an ophthalmic lens manufacturing method with the laser microdissection apparatus of Baer et al is merely based on hindsight reasoning.

Accordingly, it is respectfully requested that the rejection of claim 23, and all of the claims depending therefrom, under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

<u>Re: Claim 25</u>

Claim 25 depends from claim 24. Thus, in addition to the method of claim 23 described above, according to claim 25, a part of the sample which surrounds the necessary area is selectively

irradiated with the laser light in accordance with the pattern formed on the active optical element and is evaporated, thereby cutting the necessary area from the sample (as recited in claim 24).

Moreover, claim 25 itself recites projecting an image of the pattern formed on the active optical element onto the sample; obtaining an observation image of the sample; and <u>setting the pattern formed on the active optical element based on the obtained observation image</u>.

Portney et al has been as disclosing an active optical element. However, as noted above with respect to claim 1, each of the masks (22, 32 and 48) of Portney et al has a fixed pattern. And it is respectfully submitted that Portney et al does not at all suggest that the pattern on any of the masks can be set based on an obtained observation image of a sample. Thus, Portney et al clearly fails to suggest <u>setting the pattern formed on the active optical element based on the obtained observation image</u> as recited in claim 25.

Indeed, it is respectfully submitted that Portney et al does not at all suggest that the patterns on the fixed masks 22, 32 and 48 are set based on an observation image of the workpiece. And as recognized by the Examiner, Baer et al does not disclose an active optical element. Therefore, Baer et al clearly cannot

disclose setting the pattern formed on the active optical element based on the obtained observation image, as recited in claim 25.

Moreover, the Examiner has <u>not even mentioned</u> setting the pattern formed on the active optical element based on the obtained observation image as recited in claim 25.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the method recited in claim 25. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the method recited in claim 25.

Accordingly, it is respectfully requested that the rejection of claim 25 under 35 USC 103 as being obvious in view of Baer et al and Portney et al be reversed.

<u>Re: Claim 26</u>

Claim 26 depends from claim 23 and recites that the part of the sample excluding the necessary area is selectively irradiated with the laser light in accordance with the pattern formed on the active optical element, and the selective irradiation of the laser light is repeatedly performed while changing positions on the sample that are irradiated to irradiate all desired positions on the sample.

Moreover, according to claim 26, the method further comprises: converging a beam of the irradiated laser light onto a

beam spot on the sample; and relatively moving the beam spot of the converged beam of laser light with respect to the sample completely around an area to be collected including the necessary area.

And according to claim 26, a part of the sample irradiated with the converged beam of laser light is evaporated, such that the area to be collected including the necessary area is cut from the sample.

The Examiner <u>has not mentioned</u> the features of the method recited in claim 26.

And it is respectfully submitted that Baer et al and Portney et al clearly fail to disclose, teach or suggest the features of the method recited in claim 26, which includes both
(i) repeatedly selectively irradiating the sample with the laser light in accordance with the pattern formed on the active optical element, while changing positions on the sample that are irradiated to irradiate all desired positions on the sample, and
(ii) converging a beam of the irradiated laser light onto a beam spot on the sample, and relatively moving the beam spot of the converged beam of laser light with respect to the sample completely around an area to be collected including the necessary area, wherein a part of the sample irradiated with the converged beam of laser light is evaporated, such that the area to be collected including the necessary area is cut from the sample.

Thus, the Examiner has not asserted that Baer et al and Portney et al disclose or suggest the method recited in claim 26. And it is respectfully submitted that Baer et al and Portney et al do not, in fact, disclose or suggest the method recited in claim 26.

Accordingly, it is respectfully requested that the rejection of claim 26 under 35 USC 103 as being obvious in view of Baer et al and Portney et al also be reversed.

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In view of the foregoing, it is respectfully requested that this Board reverse the rejection of appealed claims 1-36.

Respectfully submitted,

/Douglas Holtz/

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Attachments: (1) Appendix of Appealed Claims

(viii) INDEX OF APPEALED CLAIMS

1. A microdissection apparatus comprising:

a laser light source to emit laser light; and

a laser light irradiation optical system to irradiate a sample with the laser light from the laser light source;

wherein the laser light irradiation optical system comprises: (i) an active optical element on which a variable pattern set to correspond to a necessary area is formed, and (ii) an objective lens which is positioned between the active optical element and the sample; and

wherein the laser light is irradiated through the active optical element on which the variable pattern is formed, and guided to the sample by the objective lens so that a part of the sample excluding the necessary area is irradiated with the laser light.

2. The microdissection apparatus according to claim 1, further comprising a pattern image projection optical system, which projects an image of the pattern formed on the active optical element onto the sample.

3. The microdissection apparatus according to claim 2, further comprising an observation optical system, which acquires an observation image of the sample.

4. The microdissection apparatus according to claim 3, further comprising a display unit to display the observation image acquired by the observation optical system, and an input unit to input information for setting the pattern formed on the active optical element.

5. The microdissection apparatus according to claim 3, further comprising a control unit to set the pattern formed on the active optical element based on the observation image acquired by the observation optical system.

6. The microdissection apparatus according to claim 1, wherein the laser light irradiation optical system selectively irradiates a part of the sample that surrounds the necessary area with the laser light in accordance with the pattern formed on the active optical element, and the laser light applied to the sample has an energy density sufficient for evaporating the sample, such that the part of the sample irradiated with the laser light is evaporated so as to cut the necessary area from the sample.

7. The microdissection apparatus according to claim 1, wherein the laser light irradiation optical system further comprises a relay lens which is removably inserted into an optical path between the active optical element and the objective lens, and a relay lens insertion/removal mechanism to insert and remove the relay lens into and from the optical path;

wherein when the relay lens is inserted in the optical path, the active optical element forms the pattern corresponding to the necessary area, and the laser light irradiation optical system selectively irradiates the part of the sample excluding the necessary area with the laser light in accordance with the pattern formed on the active optical element; and

wherein when the relay lens is removed from the optical path, the laser light irradiation optical system converges a beam of laser light by the objective lens to irradiate the sample with the converged beam.

8. The microdissection apparatus according to claim 7, wherein, when the relay lens is removed from the optical path, the converged beam of laser light has an energy density sufficient for evaporating the sample.

9. The microdissection apparatus according to claim 8, further comprising a movement mechanism, which relatively moves

the sample and a beam spot of the converged beam of laser light formed on the sample;

wherein the beam spot of the laser light is relatively moved on the sample by the movement mechanism completely around an area to be collected including the necessary area, and a part of the sample irradiated with the converged beam of laser light is evaporated to be cut, such that the area to be collected including the necessary area is cut from the sample.

10. The microdissection apparatus according to claim 1, wherein the active optical element comprises a transmission type active optical element.

11. The microdissection apparatus according to claim 1, wherein the active optical element comprises a reflection type active optical element.

12. A microdissection apparatus comprising:

a light source means for emitting laser light; and

a laser light irradiation optical system to irradiate a sample with the laser light from the light source means;

wherein the laser light irradiation optical system comprises: (i) pattern forming means for transmitting or reflecting the laser light selectively in accordance with a

variable pattern which is set to correspond to a necessary area, and (ii) an objective lens which is positioned between the pattern forming means and the sample; and

wherein the laser light is irradiated to the sample through the variable pattern formed by the pattern forming means, and guided to the sample by the objective lens so that a part of the sample excluding the necessary area is irradiated with the laser light.

13. The microdissection apparatus according to claim 12, further comprising a pattern image projection optical system for projecting an image of the pattern formed by the pattern forming means onto the sample.

14. The microdissection apparatus according to claim 13, further comprising an observation optical system for acquiring an observation image of the sample.

15. The microdissection apparatus according to claim 14, further comprising displaying means for displaying the observation image acquired by the observation optical system, and inputting means for inputting information for setting the pattern formed by the pattern forming means.

16. The microdissection apparatus according to claim 14, further comprising a controller for setting the pattern formed by the pattern forming means based on the observation image acquired by the observation optical system.

17. The microdissection apparatus according to claim 12, wherein the laser light irradiation optical system selectively irradiates a part of the sample that surrounds the necessary area with the laser light in accordance with the pattern formed by the pattern forming means, and the laser light applied to the sample has an energy density sufficient for evaporating the sample, such that the part of the sample irradiated with the laser light is evaporated so as to cut the necessary area from the sample.

18. The microdissection apparatus according to claim 12, wherein the laser light irradiation optical system further comprises a relay lens, which is removably inserted into an optical path between the pattern forming means and the objective lens, and a relay lens insertion/removal mechanism, which inserts and removes the relay lens into and from the optical path;

wherein when the relay lens is inserted in the optical path, the pattern forming means forms the pattern corresponding to the necessary area, and the laser light irradiation optical system

selectively irradiates the part of the sample excluding the necessary area with the laser light in accordance with the pattern formed on the pattern forming means; and

wherein when the relay lens is removed from the optical path, the laser light irradiation optical system converges a beam of laser light by the objective lens to irradiate the sample with the converged beam.

19. The microdissection apparatus according to claim 18, wherein, when the relay lens is removed from the optical path, the converged beam of laser light has an energy density sufficient for evaporating the sample.

20. The microdissection apparatus according to claim 19, further comprising moving means for relatively moving the sample and a beam spot of the converged beam of laser light formed on the sample;

wherein the beam spot of the laser light is relatively moved on the sample by the moving means completely around an area to be collected including the necessary area, and a part of the sample irradiated with the converged beam of laser light is evaporated to be cut, such that the area to be collected including the necessary area is cut from the sample.

21. The microdissection apparatus according to claim 12, wherein the pattern forming means comprises a transmission type active optical element.

22. The microdissection apparatus according to claim 12, wherein the pattern forming means comprises a reflection type active optical element.

23. A microdissection method comprising:

forming a variable pattern on an active optical element such that the pattern is set to correspond to a necessary area of a sample; and

irradiating the active optical element with laser light; and

guiding the laser light from the active optical element to the sample, via an objective lens positioned between the active optical element and the sample, so as to irradiate a part of the sample excluding the necessary area with the laser light.

24. The microdissection method according to claim 23, wherein a part of the sample which surrounds the necessary area is selectively irradiated with the laser light in accordance with the pattern formed on the active optical element and is evaporated, thereby cutting the necessary area from the sample.

25. The microdissection method according to claim 24, further comprising:

projecting an image of the pattern formed on the active optical element onto the sample;

obtaining an observation image of the sample; and

setting the pattern formed on the active optical element based on the obtained observation image.

26. The microdissection apparatus according to claim 23, wherein the part of the sample excluding the necessary area is selectively irradiated with the laser light in accordance with the pattern formed on the active optical element, and the selective irradiation of the laser light is repeatedly performed while changing positions on the sample that are irradiated to irradiate all desired positions on the sample; and

wherein the method further comprises converging a beam of the irradiated laser light onto a beam spot on the sample; and

relatively moving the beam spot of the converged beam of laser light with respect to the sample completely around an area to be collected including the necessary area;

wherein a part of the sample irradiated with the converged beam of laser light is evaporated, such that the area to be collected including the necessary area is cut from the sample.

27. The microdissection apparatus according to claim 1, further comprising an observation optical system, which acquires an observation image of the sample.

28. The microdissection apparatus according to claim 27, wherein the observation optical system comprises an erecting microscope.

29. The microdissection apparatus according to claim 27, wherein the observation optical system comprises an inverted microscope.

30. The microdissection apparatus according to claim 3, wherein the objective lens of the laser light irradiation optical system is also part of the observation optical system.

31. The microdissection apparatus according to claim 27, wherein the objective lens of the laser light irradiation optical system is also part of the observation optical system.

32. The microdissection apparatus according to claim 3, wherein the observation optical system comprises an erecting microscope.

33. The microdissection apparatus according to claim 3, wherein the observation optical system comprises an inverted microscope.

34. The microdissection apparatus according to claim 10, wherein the transmission type active optical element comprises a liquid crystal substrate.

35. The microdissection apparatus according to claim 11, wherein the reflection type active optical element comprises a micro mirror array.

36. The microdissection apparatus according to claim 1, wherein the laser light irradiation optical system selectively irradiates a part of the sample that surrounds the necessary area with the laser light in accordance with the pattern formed on the active optical element, the laser light applied to the sample is relatively moved on the sample by a movement mechanism completely around an area to be collected including the necessary area, and a part of the sample irradiated with the converged beam of laser light is evaporated to be cut, such that the area to be collected including the necessary area is cut from the sample.

(ix) EVIDENCE APPENDIX

Not applicable

(x) RELATED PROCEEDINGS APPENDIX

Not applicable